

$$S_n = \frac{a_1 - a_1 r^n}{1 - r}$$

$$S_n = \frac{a_1 - a_n r}{1 - r}$$

$$a_n = a_1 r^{n-1}$$

1.  $r = \frac{1}{2}$

$$a_6 = 896 \left(\frac{1}{2}\right)^5$$

$$a_6 = 28$$

2.

$$\frac{4}{81}, \frac{4}{27}, \frac{4}{9}$$

$$r = 3$$

$$a_6 = \frac{4}{81} (3)^5$$

$$a_6 = 12$$

3.

$$\frac{13}{16}, \frac{13}{8}, \frac{13}{4}$$

$$r = 2$$

$$a_6 = \frac{13}{16} (2)^5$$

$$= 26$$

4.  $r = -1$

$$a_{13} = 29 (-1)^{12}$$

$$29$$

5.  $5^{-7}, 5^{-6}, 5^{-5}$

$$a_{10} = 5^{-7} (5)^9$$

$$5^2$$

$$125 \quad 25$$

6.  $r = \frac{1}{2}$

$$a_5 = 208 \left(\frac{1}{2}\right)^4$$

$$13$$

7.  $a_{12} = 23^{-10} (23)^{11}$

$$23$$

8.  $r = -2$

$$S_6 = \frac{3 - 3(-2)^6}{1 + 2}$$

$$\frac{65}{-63}$$

9.  $r = -3$

$$S_9 = \frac{\frac{1}{27} - \frac{1}{27}(-3)^9}{1 + 3}$$

$$\frac{547}{27} = 20 \frac{2}{27}$$

10.  $a_1 = -81$

$$r = -\frac{1}{3}$$

$$a_4 = -81 \left(-\frac{1}{3}\right)^3$$

$$a_4 = 3$$

11.  $-64 = \frac{1}{16} r^5$

$$-1024 = r^5$$

$$-4 = r$$

$$a_4 = \frac{1}{16} (-4)^3$$

$$a_4 = -4$$

12.

$$a_3 = -12 \quad a_1 =$$

$$a_6 = -324$$

$$-324 = -12(r)^3$$

$$27 = r^3$$

$$3 = r$$

$$-12 = a_1 (3)^2$$

$$-\frac{4}{3} = a_1$$

13.  $a_5 = \frac{10}{27} \quad r = \frac{1}{3}$

$$\frac{10}{27} = a_1 \left(\frac{1}{3}\right)^4$$

$$30 = a_1$$

14.  $S_4 = 40$

$$r = 3 \quad a_4 = ?$$

$$40 = \frac{a_1 - a_1 (3)^4}{1 - 3}$$

$$40 = \frac{a_1 (1 - 81)}{-2} \quad a_4 = 27$$

$$1 = a_1$$

15.  $\frac{2}{m} = \frac{m}{27}$

$$m^2 = \frac{27 \cdot 2}{1 \cdot 3}$$

$$m = 3\sqrt{6}$$

$$\frac{27}{\sqrt{\frac{27}{2}}} = \sqrt{r^2} \rightarrow$$

$$\frac{\sqrt{27} \cdot \sqrt{2}}{\sqrt{27} \cdot \sqrt{2}} = \frac{\sqrt{54}}{2}$$

$$r = \frac{3\sqrt{6}}{2}$$

$$2^{24}, 288$$

$$288 = 2r^2 \quad 16.$$

$$\frac{2}{m} = \frac{m}{288}$$

$$144 = r^2$$

$$m = 28 \cdot 144$$

$$\pm 12 = r$$

$$m = 24$$

$$2 \times 12 = \boxed{24}$$

$$19. a_1 = 63$$

$$a_5 = \frac{2}{9}$$

$$r > 0$$

$$a_2 = ?$$

$$\frac{1}{9} = 63r^4$$

$$\frac{1}{84} = r^4$$

$$\frac{1}{3} = r$$

$$a_2 = \frac{1}{21}$$

$$17. \frac{1}{64}, \frac{1}{16}, \frac{1}{4}, 1, 4$$

$$4 = \frac{1}{64} r^4$$

$$256 = r^4$$

$$4 = r$$

$$\textcircled{20.} a_1 = 300$$

$$r = 1.3$$

$$S_4 = \frac{300 - 300(1.3)^4}{1 - 1.3}$$

$$= \frac{297.57}{-.3}$$

$$= 425 \frac{1}{10}$$

$$18. a_1 = 1500$$

$$a_5 = \frac{12}{5} \quad r > 0$$

$$\frac{12}{5} = 1500 r^4$$

$$\frac{1}{625} = r^4$$

$$\frac{1}{5} = r$$

$$\textcircled{21} \quad \frac{1}{5} \quad r = \frac{1}{5}$$

$$\textcircled{22} \quad r = -3 \quad -\frac{4}{3}$$

$$\textcircled{23} \quad r = -\frac{1}{2} \quad -4$$

$$\textcircled{24} \quad r = -.125 \quad 20$$

$$\textcircled{25} \quad r = -8 \quad 8$$

$$\textcircled{26} \quad a_3 = 1$$

$$a_{10} = 12^7$$

$$\boxed{128}$$

$$\textcircled{27} \quad a_{12} = 1.2^9$$

$$512$$

$$\frac{128}{512} = \frac{1}{4}$$

$$\textcircled{28} \quad a_1 = 480$$

$$r = \frac{1}{2}$$

$$a_{17} = 480 \left(\frac{1}{2}\right)^5$$

$$15$$

$$\textcircled{29} \quad a_{17} = 480 \left(\frac{1}{2}\right)^7$$

$$\frac{3.75}{9.00}$$

$$\textcircled{30} \quad -43$$